Space-time BIE methods for non homogeneous exteriorwave equation problems. The Dirichlet case.

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Abstract

In this paper we consider the (2D and 3D) exterior problem for the non homogeneous wave equation, with a Dirichlet boundary condition and non homogeneous initial conditions. First we derive two alternative boundary integral equation formulations to solve the problem. Then we propose a numerical approach for the computation of the extra "volume" integrals generated by the initial data. Finally, to show the efficiency of this approach, we solve some test problems by applying a second order Lubich discrete convolution quadrature for the discretization of the time integral, coupled with a collocation first, and a Galerkin then, boundary element method.

KEY WORDS: wave equation; non homogeneous conditions; space-time boundary integral equations; numerical methods

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